Missouri

Public Safety
and
Critical Infrastructure

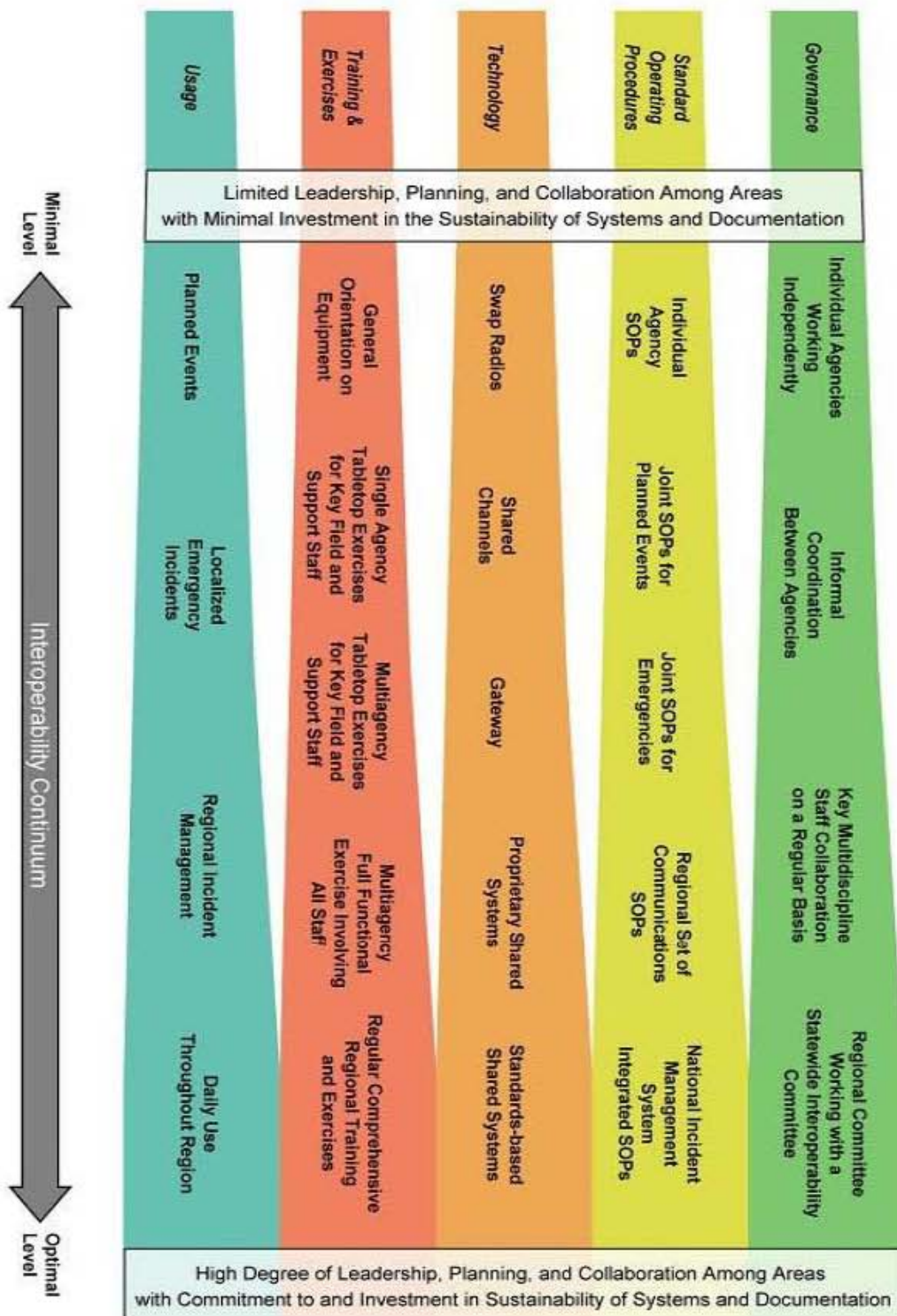# Communications
Strategic Plan
2007

Introduction

Missouri still struggles to achieve interoperable communications, as do many states. Commendable strides have been made throughout the state to cooperate and coordinate communications in the event of an emergency, yet the lack of an over-arching communications strategy has hampered measurable, broad-based progress. Events of the past five years have brought an awareness of the absolute need for reliable communications among emergency responders and the trials faced by responders to those events have given Missouri the opportunity to evaluate its own state of readiness and to prepare accordingly.

Certainly, shortcomings exist in emergency response communications that require serious attention in the short-term. Many of these particular issues have already been addressed in part through interoperable channel sharing, readiness exercises, cross-banding equipment, coordinated planning, and cached radio assets assisted by Homeland Security grant funding. While work continues to ensure short-term needs are met, long-term goals and strategies whereby to achieve those ends are still forthcoming.

Governor Blunt's Executive Order 06-23 has made the Missouri State Interoperability Executive Committee (SIEC) responsible for producing the goals and strategies *"to serve as the vision to establish and maintain interoperable communications initiatives among Missouri's public safety and critical infrastructure communities."* This document outlines a strategic plan drafted by Missouri's SIEC for our future radio communications environment. Its intent is to illustrate a compliment of common goals for public safety and critical infrastructure communications in Missouri based on a template developed by the U.S. Department of Homeland Security's project SAFECOM as well as setting strategies for attaining those goals.
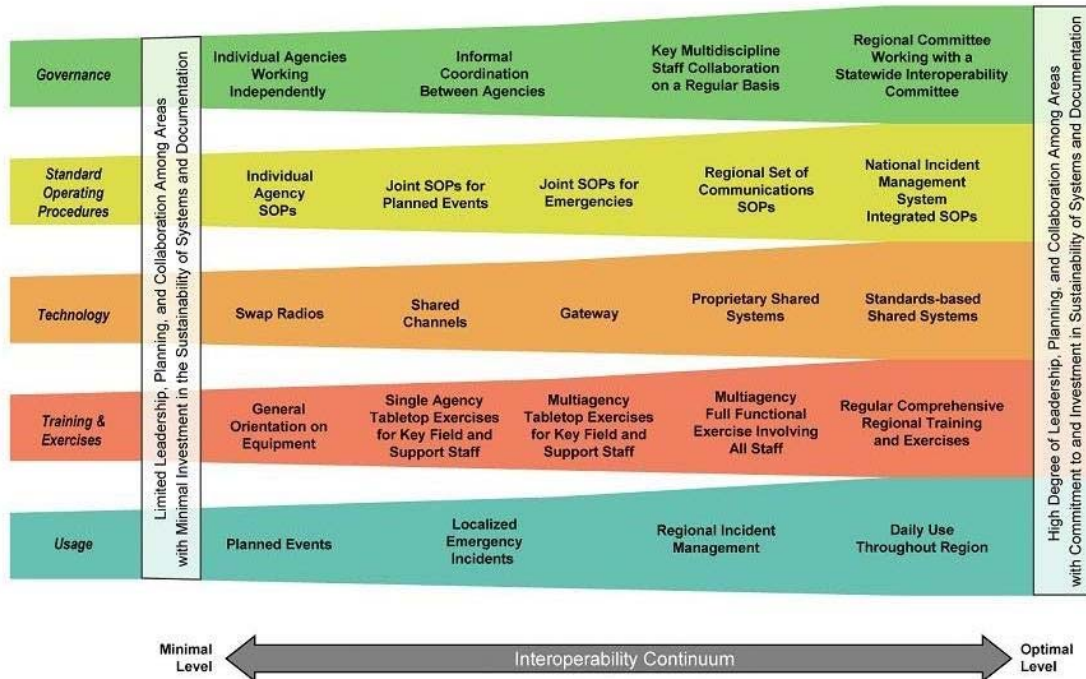
In a SAFECOM publication referred to as the "Interoperability Continuum", the template presents guidelines in five categories: Governance, Standard Operating Procedures, Technology, Training and Exercises, and Usage. The publication identifies various approaches to achieving interoperability in each category rated by the level of interoperability they can achieve noting that some approaches offer only minimal interoperability while others are optimal.

The goals in this strategic plan, while broad in nature, set a direction that public safety and critical infrastructure communications officials in Missouri should incorporate into their short-term and long-term plans. Not to be mistaken for mandated requirements, the following are goals the Missouri State Interoperability Executive Committee has adopted to improve public safety communications in the hopes of correcting our known shortfalls and avoiding communications failures in the future. An aggressive implementation program will ensure these goals can be attained for public safety and critical infrastructure radio users throughout Missouri.

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Interoperability Continuum (Minimal Level → Optimal Level)

Limited Leadership, Planning, and Collaboration Among Areas with Minimal Investment in the Sustainability of Systems and Documentation

Governance	Standard Operating Procedures	Technology	Training & Exercises	Usage
Individual Agencies Working Independently	Individual Agency SOPs	Swap Radios	General Orientation on Equipment	Planned Events
Informal Coordination Between Agencies	Joint SOPs for Planned Events	Shared Channels	Single Agency Tabletop Exercises for Key Field and Support Staff	Localized Emergency Incidents
Key Multidiscipline Staff Collaboration on a Regular Basis	Joint SOPs for Emergencies	Gateway	Multiagency Tabletop Exercises for Key Field and Support Staff	Regional Incident Management
Regional Committee Working with a Statewide Interoperability Committee	Regional Set of Communications SOPs	Proprietary Shared Systems	Multiagency Full Functional Exercise Involving All Staff	Daily Use Throughout Region
	National Incident Management System Integrated SOPs	Standards-based Shared Systems	Regular Comprehensive Regional Training and Exercises	

High Degree of Leadership, Planning, and Collaboration Among Areas with Commitment to and Investment in Sustainability of Systems and Documentation

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The "Interoperability Continuum"

The Department of Homeland Security's Project SAFECOM published the graphic shown below to categorize and rank the many methods to achieving communications interoperability by their effectiveness.

The categories identified in the far left column of the graphic are: Governance, Standard Operating Procedures, Technology, Training & Exercises, and Usage. Each of these categories plays a role in optimizing the communications environment in which we operate. To the right along each of these categories are descriptions of various states of interoperability within that category. The farther to the right, the higher the level of interoperability described until ultimately, in the far right column, the optimal level of performance for the category is described. Missouri's goal is to attain these optimal levels of performance. At this level there is as indicated in on the right edge of the Continuum graphic:

> "***High Degree of Leadership, Planning, and Collaboration Among Areas with Commitment to and Investment in Sustainability of Systems and Documentation***"

This is the vision of an ultimate interoperability environment Missouri has not yet achieved. Following is an evaluation of our current interoperability environment and the forces at work within it. "Optimal Level" for each of the five categories of interoperability is discussed in the pages that follow and defined in more detail as they apply to Missouri. Specific goals and strategies, in use or proposed, are outlined in each area.

The Current Interoperability Environment

To fairly evaluate Missouri's status today in public safety communications and the progress we are making, it is beneficial to generally understand where public safety communications started and what shaped its growth. In the distant past when radio spectrum was more plentiful, radio traffic was lighter, and there were fewer radio users, radio systems were developed by individual agencies as needed to support their primary mission. That mission may have been fire fighting, law road building, nature preservation, utility services, medical services, etc. for any entity with the resources to build the radio system. As a support tool, radio systems were not interfaced or shared because the primary missions of those entities were not themselves interfaced or shared. Early radio technologies made it cumbersome to share radio resources. Because communications became a critical support function, it was more important to keep radio operations protected from harmful interference - and from one another - than it was to share the resource.

This insulated and unplanned system development has resulted in a communications environment comprised of hundreds of autonomous radio systems with thousands of FCC licenses and tens of thousands of users which cannot seamlessly interact. Every county has at least one radio system, perhaps more than one for police, fire, and Emergency Medical Service (EMS.) Many cities have systems separate from the counties. The state has additional statewide or wide area systems for various departments and dozens of smaller systems for individual facilities such as prisons, hospitals, and campuses. Utilities are structured in much the same way.

As an example, on the grounds of the State Capitol in Jefferson City we can expect radio coverage on separate radio systems dedicated to:
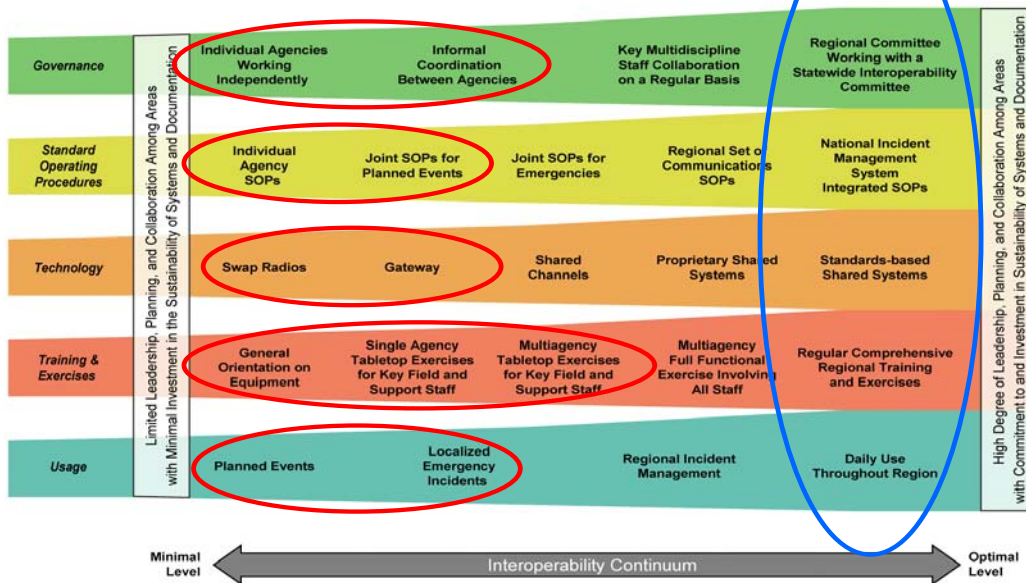
> - Jefferson City Police Department
> - Jefferson City Fire Department
> - Cole County Sheriff's Department
> - Cole County Fire Department
> - Capital Police Department
> - Office of Administration Facilities Management
> - Missouri State Water Patrol
> - Missouri State Highway Patrol
> - Missouri Department of Conservation
> - Missouri Department of Transportation
> - Ameren UE
> - Central Electric Power Cooperative
> - Three Rivers Electric Cooperative

There may be other public safety / critical infrastructure systems with coverage as well such as Department of Corrections, Boone County, and Callaway County. Most are in the same frequency band so user-to-user communications is possible for them but not for users in other bands. Jefferson City and Cole County systems are operated in the same

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dispatch center so they have an inherent interoperability. The others are operated independently. In the emerging era of effectiveness, efficiency, cooperation, mutual aide, and information sharing now expected and demanded, this fragmented and redundant communications structure is obsolete.

Missions of agencies have evolved, beginning to cross and overlap with mutual aide and joint response for efficiency and effectiveness. However, as radio technologies have progressed, protective methodologies have not kept pace. Cultural resistance to change and limited communications funding have held the communications capabilities of most agencies well behind the standards now being accepted. Adequate staffing, equipment replacement, exercises, and training have been limited by available funding. Culturally, public safety has been hesitant to accept changes in governance, standard operating procedures, and usage of radio communications. Both can be attributed to the way systems have developed independently of one another. Few individual agencies can justify a business case to build an elaborate and expensive state-of-the-art radio system on their own individual budgets and perhaps redundant to adjacent users. Likewise, few agencies are eager to relinquish the high degree of control they have enjoyed over their own radio system to an outside authority.

Shown again below is the SAFECOM Interoperability Continuum with an indication, on the left in red, of where the majority of Missouri's public safety communications community can be ranked in terms of development in each category. Note that we do show some level of capability in each of the five areas. Some agencies or regions can be ranked higher or perhaps even lower, but largely the graphic depicts an overall snapshot of "interoperability". We are improving. Slowly and steadily we are improving - but the status quo, by definition, does not promote rapid progress. On the right, in blue, is our goal.

Interoperability Continuum — Homeland Security / SAFECOM

Forces of Change

Several elements have now combined to bring about change in the status quo. Several **"*Best Practices*"** forces are creating opportunities to advance, making it easier to move ahead, while **"*Recognized Mandates*"** are requiring change be affected though neither collectively nor concertedly.

Best Practices opportunities to advance such as:

➢ Homeland Security funding
➢ Public awareness of the need for heightened security
➢ Public and private partnership opportunities
➢ Open and cooperative dialogue among users
➢ Availability of communications technologies and resources
➢ Solidification of communications standards
➢ Concurrent system development plans in the local, state, federal, and critical infrastructure arenas

Mandated forces such as:

➢ 2013 Federal Communications Commission (FCC) narrow-banding mandate
➢ Nextel 800MHz re-banding plan

- ➢ Department of Homeland Security mandated National Incident Management System (NIMS) compliance
- ➢ Time widening the gap between legacy equipment and state of the art equipment
- ➢ Saturation in VHF high band usage in populous areas
- ➢ Demand for efficiency and quality of service
- ➢ Demand for response preparedness for man-made and natural threats

and most importantly:

- ➢ Demand to meet the changing communications needs of emergency responders

In truth, the forces holding us back come down to only *mindset* and *funding*.

In terms of mindset there is not only an issue of the independent control, but also a difference of opinion as to "how much is good enough." Some hold that Missouri need only pursue a course that will bring basic interoperable communications to emergency responders. The belief is that near-term actions required to enable interoperability are sufficient. Others assert that a basic level of interoperability for Missouri's emergency responders is only a beginning and is not sufficient as a goal. While near-term actions are needed, the majority conclude near- term actions that do not contribute to a long-term goal weaken our ability to achieve that goal. The SAFECOM Interoperability Continuum clearly illustrates in each category several levels of interoperability that are near-term actions short of a long-term solution.

Realistically, funding becomes the deciding factor. Sufficient commitment of funds to meet the long-term goal will bring about tremendous progress in Missouri's public safety communications for all users. Conversely, insufficient funding will limit Missouri to only near-term actions. Near-term actions are needed but will not provide a thorough solution to interoperability problems. They are not likely to provide additional capacities or capabilities to emergency responders.

Direction to Move

Clearly change will occur. Circumstances are such that forces at work will require changes in the current communications environment. Without planning, preparation, and guidance those changes will be circumstantial in nature. It is the responsibility of decision makers to set the proper direction for Missouri's future – long-term Surrounding states have shouldered this effort and are making progress. The trends for progress in those states, as in many states around the country, are new state-sponsored, statewide radio networks. In the public safety communications industry in general, system upgrades trend toward trunked systems in higher capacity in higher frequency bands. The movement nationwide is to share systems rather than keeping them independent, which makes interoperability inherent.

This strategic plan shall serve as Missouri's roadmap to develop interoperability among public safety and critical infrastructure radio users and for radio communications

development. While comprehensive, this document is not complete. This is a high-level outline of the many strategies Missouri has adopted to attain its radio communications goals and objectives. As in all projects, planning must continue as we implement the strategies outlined here – refining our goals and our direction. Target dates are indicated for each strategy.

The Plan

Strategic Issue: Governance

State Interoperability Executive Committee (SIEC)

In 2001 the Missouri Department of Public Safety (DPS), acting on FCC recommendation, authorized the formation of the SIEC to address interoperability issues in the newly formed 700 MHz public safety radio band. Early on, the committee also accepted the role of addressing interoperability issues in all public safety radio bands to foster coordination and improvement in communications. An informal ad hoc committee, the group acts as an advisory body of subject matter experts and as a forum for the discussion of interoperability and spectrum issues in public safety communications.

The SIEC has been instrumental in setting standards for interoperable communications equipment and recommending distribution of Homeland Security funding. In addition, the group has actively promoted and implemented initiatives to address interoperability such as sponsoring statewide interoperability channels and developing the policies for their use. SIEC meetings are open to the public and are typically held every sixty to ninety days though meetings may be more frequent to address timely issues.
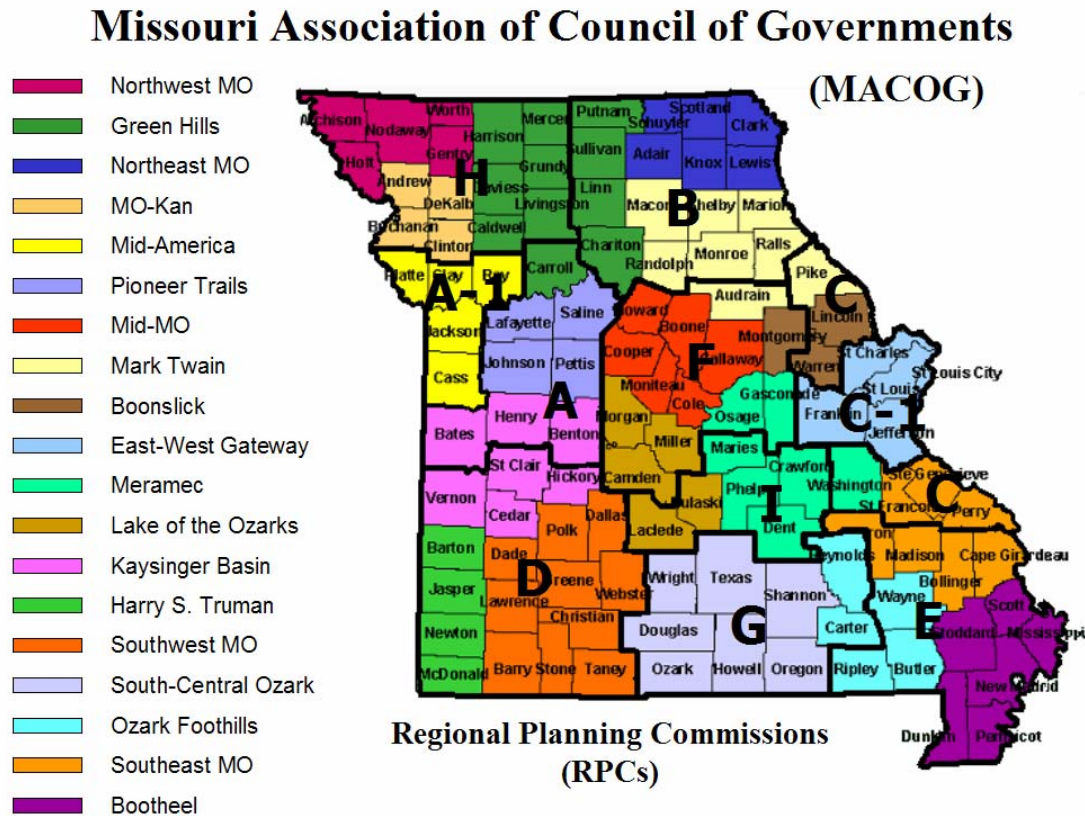
Regional Committees

Regional planning for public safety communications has been strongly advocated by the Department of Homeland Security (DHS) and other public safety communication-centric bodies such as the Association of Public Safety Communications Officials (APCO), the National Public Safety Technology Committee (NPSTC), the National Task Force on Interoperability (NTFI) and the Public Safety Wireless Network (PSWN), now part of DHS - SAFECOM.

The idea behind regionalized planning is for agencies to collectively work with other agencies around them to determine how they will communicate in times of crisis and what measures must be taken to enable those lines of communication. This type of cooperation at the local level has existed to varying degrees for many years. The sharing of assets, resources, and information has proven to be invaluable. It is absolutely critical that these activities among local agencies continue to develop.

To facilitate regional development, The Missouri State Emergency Management Agency (SEMA), for the purposes of planning for DHS funding disbursement, has divided the state into eleven planning regions. These eleven regions outlined on the map below are based on nine legacy Missouri State Highway Patrol (MSHP) Troop regions and two DHS Urban Area Security Initiative (UASI) regions surrounding the metropolitan St. Louis and Kansas City areas. These are further broken down more locally and in some

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cases overlapped by the Missouri Association of Council of Governments Regional Planning Commissions shown in color on the following illustrated map.

Within each of these regions, representatives of the agencies in the regions can plan communications on a region wide basis. Representatives of each region, in turn, should likewise participate in the SIEC for statewide planning.

1. Goal: Regional Representatives working with a Statewide Interoperability Committee

Objective:

1.1. To develop an inclusive communications program built upon State Interoperability Executive Committee (SIEC) recommendations to meet the interoperable communications needs in Missouri.

Strategies:

1.1.1. Define the roles and responsibilities of the Missouri SIEC (4/1/07)
1.1.2. Identify a program oversight body (7/1/07)
1.1.3. Identify a program management and administration body (7/1/07)
1.1.4. Establish service level agreements between participants and administration body (1/1/08)
1.1.5. Formalize and organize the business conducted by the SIEC (4/1/07)
1.1.6. Establish and document the state's commitment to an inclusive communications program (7/1/07)
1.1.7. Establish and document Missouri's plan and priorities for interoperable communications (4/1/07)
1.1.8. Lead by example with State commitment to acceptance and implementation of the strategic plan (7/1/07)
1.1.9. Adhere to program policies (10/1/07)
1.1.10. Identify potential funding streams to fund system construction (4/1/07)
    1.1.10.1. Use Homeland Security grant funding as much as possible
    1.1.10.2. Identify available state funding to build system infrastructure
    1.1.10.3. Identify state funding currently expended on radio communications for ongoing maintenance
    1.1.10.4. Leverage funding agencies must spend on new radio equipment to become compliant with FCC narrow banding mandate to bring them onto the system

Objective:

1.2. To have local and regional participation with the SIEC in radio communications development in Missouri.

Strategies:

1.2.1. Define the roles and responsibilities of the Regional Planning groups in communications interoperability and their relationship with the SIEC (4/1/07)
1.2.2. Accept representatives from the eleven regional planning groups to be liaisons to the SIEC (1/1/07)
1.2.3. Establish and document regional communication plans and priorities (7/1/07)
1.2.4. Include private partners, such as critical infrastructure groups, in the communications program (7/1/07)
    1.2.4.1. Establish criteria and policies for participation in the communications program
1.2.5. Define the roles and responsibilities of interoperable communications users (7/1/07)
1.2.6. Establish cooperative procurement mechanisms to promote easy access to program technologies (1/1/08)

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1.2.7. Provide incentives to assist agencies wishing to participate in the program (1/1/08)

1.2.8. Provide education and outreach to raise awareness of the program and standards (7/1/07)

1.2.9. Create a clearinghouse to see that information is distributed adequately. (Website, list serve) (4/1/07)

Strategic Issue: Standard Operating Procedures (SOPs)

Joint SOPs

Public Safety agencies should all have and adhere to documented Standard Operating Procedures by which their own internal communications is handled. A required part of every SOP is a plan for communications with other agencies under routine, planned, and emergency circumstances - agency-to-agency, responder-to-responder, discipline-to-discipline.

> Who are the participants?
> What are their roles and responsibilities?
> What radio channels will be used?
> How will the channels be identified?
> How will users from different agencies be identified on the air?
> What are the on-air protocols?
> Who are the points of contact?
> Under what circumstances will contacts be made?
> What are critical phone numbers?

These are all questions which should be answered and documented for reference. A dialogue between agencies is needed to assemble this plan.

Regional SOPs

Joint SOPs can be developed agency by agency but interoperability is best served by a broad-based, regional approach. If several agencies covering a large area can agree upon and use a Regional set of SOPs, communications can be facilitated over a much larger area. A Regional SOP will be a more comprehensive document in terms of information, but procedures should be generally uniform from region to region.

National Incident Management System

To foster uniformity in operating procedures, DHS has adopted a National Incident Management System (NIMS) as the standard with which interoperable communications SOPs should comply. DHS is making NIMS compliance a requirement for future grant qualifications and NIMS must be addressed in SOPs.

2. Goal: National Incident Management System (NIMS) Integrated SOPs

Objective:

2.1. To adopt and implement NIMS communications procedures as the standard operating procedures for all interoperable communications.

Strategies:

2.1.1. Lead by example with state acceptance and implementation of NIMS communications procedures (10/1/06)
2.1.2. Implement the proper usage of NIMS communications procedures for all interoperable communications (7/1/07)

Objective:

2.2. To develop and maintain coordinated and consistent NIMS compliant SOPs in local, regional, and state agencies.

Strategies:

2.2.1. Use standard nomenclature in all SOPs (1/1/08)
2.2.2. Develop state NIMS compliant SOP templates for distribution (1/1/07)
2.2.3. Document interoperable communications procedures for both discipline specific and non-discipline specific communications (7/1/07)
2.2.4. Catalog assets available to assist in interoperable communications (1/1/08)

Objective:

2.3. To increase awareness of SOPs among all public safety and critical infrastructure users

Strategies:

2.3.1. Provide education and outreach to users regarding NIMS compliant SOPs (1/1/07)
2.3.2. Share and review SOPs with surrounding states (4/1/07)
2.3.3. Establish a website to distribute information (1/1/07)
2.3.4. Distribute SOPs and asset lists (1/1/07)

Strategic Issue: Technology

Technology based problems and solutions are only a part of the interoperability effort but are often the most misunderstood and therefore usually regarded as the most difficult to overcome. While the technology is often complex, the functional solution, that is, what the technology brings to the user, is relatively straightforward. Unfortunately, these solutions are more often impeded by lack of funding rather than under-developed technology. Because funding may severely limit the level of interoperability attainable by a given agency, each level of the technology category is described below with the benefits and limitations of each as well as some brief best practices. Optimally, any technology solution attempted should be as compatible with highest level solutions as possible to ensure their long-term viability.

Radios

Public safety radios are subject to FCC type acceptance and are held to high standards of performance and reliability. But not all radios are alike. In fact, radios can vary greatly. They can be conventional or trunked, analog or digital, narrowband or wideband, Project 25 (P25) or proprietary, VHF low band or VHF high band or UHF or 700-800 MHz. All of these differences work *against* interoperability. Conversely, like equipment *promotes* interoperability. In some cases, the easiest and quickest method of enabling interoperable communications is to simply "swap" radios. If an agency needs to talk to visitors from outside the agency, they simply issue them radios with which to communicate or the visitors furnish the agency a radio to use to contact them.

If multiple agencies are involved, individual users may need multiple radios. This method requires some preparation and prior planning to have resources available. It also requires some prior contact between users to issue the radios and yet the establishment of the lines of communications is ad hoc.

The caching and swapping of radios is an effective, basic method but is severely limited to the availability and the capability of the radios swapped. It is best utilized as a short-term deployable fix rather than a long-term, day-to-day solution.

Gateways

Another method of overcoming the differences between radios and frequencies is to bridge those differences with an intermediate device. These are commonly referred to as "gateways". Gateways function as interpreters between dissimilar radios. In a typical configuration if dissimilar radios are in use at an event, one or more of each type of radio is interfaced into the gateway. The gateway then sets up patches between the dissimilar radios to allow information to pass from user to user despite the incompatibility of their radio equipment.

This method eliminates the need for users to carry multiple radios. It can be set up to be basically transparent to users and does not require any hand-off of equipment before users can communicate. It is also more flexible, through configuration, in its capabilities. However, prior preparation and planning are still needed. The gateway and associated radios have a significant cost. Users must know what channels are patched together to access and communicate through the switch. Depending on the complexity of the communications problems experienced, trained personnel may be needed to monitor and alter the configuration of the equipment on an as-needed basis. There are some capacity limitations to these devices in terms of simultaneous conversations through the units. In addition, the bridge can only be completed if both end users are within range of the radios connected to the device (or devices if interconnected.)

Gateway devices are a functional improvement over swapping radios but still have significant limitations. Though probably best used as a deployable solution for specific, contained events, it can be used in a day-to-day fashion within the limitation of the devices.

Shared Channels

Functionally, sharing is a better solution than swapping or bridging. Use of common shared channels among a group of users allows for immediate and as needed day-to-day use of the solution as well as during emergency incidents. In operation, users simply select the channel to open communications with the required agency. The channels can be those licensed to the specific agencies involved but the solution is better served over a broad area by using channels specifically set aside for interoperable radio communications. Any user with the channel(s) in their radio can communicate with any other user (in range) who also has the channel(s). These channels are listed in the SIEC's interoperability Memorandum of Understanding (MOU) shown in Appendix A and can be utilized by executing the MOU with the SIEC.

This method is limited by the radio differences previously listed. To use a common frequency, the radios in use must all operate in the same frequency band (VHF, UHF, 700-800 MHz), with the same transmission protocol (digital P25, digital proprietary, analog). The channels must be programmed into all the users' radios with some organized procedure for their use. This requires some prior planning and cooperation between agencies. In using shared channels there is a risk of over-using or "saturating" the channels with too much traffic rendering them less effective. Preventing saturation also requires cooperation and planning in Standard Operating Procedures for the use of the channels. In the case of the interoperability channels, some guidelines have been set in the SIEC MOU.

Though functionally a sound, ongoing solution which can be used over a wide area day-to-day and in emergencies by predetermined or itinerant users, it is limited to users of like frequency bands and transmission types. No additional equipment is needed other than the channel capacity in the existing radios.

Because VHF high band is the most widely used band of frequencies in the state, channel sharing is focused in that band. Unfortunately that is also the most congested public safety band as well. Many agencies share their own frequencies as well as interoperability frequencies specifically set aside for inter-agency communications. Similar interoperability frequencies exist in the UHF, 700MHz, and 800MHz radio bands.

Proprietary Shared Systems

Taking channel sharing a step further, shared radio systems also share the infrastructure of the system among all the users from multiple agencies and disciplines. All users on the system then will have like equipment and can intercommunicate through the system and user-to-user off the system if so designed. Typically such systems are scaleable, have sufficient capacity to accommodate a large number of users, and have control flexibility to set up group patches on the fly in response to circumstances. Multiple radio bands can also be designed into the system.

Such systems are very complex and very expensive but offer an extremely high level of interoperable communications to all users *on the system*. The drawback of such shared systems is that many of them are *proprietary*, that is, the control and operation protocols are specific to the manufacturer of the equipment. Different manufacturers use different protocols that are incompatible rendering the radios incompatible. Generally, user radios from different manufacturers can default to a non-protocol based analog operation for user-to-user communication, but protocol-based on-system communication is not possible. Therefore, high-level interoperability is only available to users defined in the system. Visiting radios using different protocols are very limited.

The use of shared systems has generally been confined to metropolitan areas of Missouri with a large user population. Sharing in systems, even if they are proprietary, is encouraged, but development of *new* proprietary systems in Missouri is strongly discouraged. Proprietary systems all should eventually conform to established national standards.

Standards-based Shared Systems

The optimal level of technical interoperability to mobile users is the *standards-based* shared system. While such systems may be more costly than user's current systems they afford the advantage of having all of the capacity, flexibility, and shared advantages of a proprietary system plus the radio system protocols and interfaces are compatible among multiple manufacturers. The accepted over-the-air user-driven radio system digital protocol standard is called Project 25 (P25). This standard currently allows user radios to communicate user-to-user over-the-air in analog and digital formats in the conventional mode and will, with manufacturers' compliance, allow user-to-user and user-to-agency

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communications in the trunked mode. Additionally, the P25 standard also enables system-to-system interfaces.

Standards-based shared systems may be comprised of tens or hundreds of radio sites all of which must be connected together to establish one system, fixed site network. The interconnection of sites may be accomplished primarily through three methods: telephone wire-line, microwave radio link, and fiber-optic cable. A number of digital network protocols continue to be used across the fixed site network however Internet Protocol (IP) has gained widespread acceptance as the default standard in public safety, industrial, and residential networking. Commercial access and development of the standard has made equipment and services widely and readily available.

This networked approached to radio communications has the most flexibility and potential of all technical solutions. The expense of the systems and the continued operations and upkeep force them to be built only for large user bases. By sharing standards based systems, multiple agencies can minimize their individual investment in the system while maximizing their interoperability potential.

3 Goal: Standards-based Shared System

Objective:

3.1. To meet the technical needs of interoperable communications users.

Strategies:

3.1.1. Develop mechanisms to connect disparate radio users on a common system (4/1/09)

3.1.2. Make on-scene, tactical communications available at all times (4/1/08)

3.1.3. Make scene to base, operational communications available at all times (4/1/08)

3.1.4. Define what wireless and wire-line protocols will be accommodated in the system (10/1/07)

3.1.5. Configure the system for ease of operation for the field user (7/1/08)

3.1.6. Make it easy for users to purchase compatible system equipment (7/1/08)

3.1.7. Minimize funding obstacles to end users (4/1/08)

3.1.8. Catalog systems and equipment currently in use throughout Missouri (7/1/07)

3.1.9. Provide availability of common channels throughout Missouri (10/1/08)

3.1.10. Identify the changing needs, roles, and priorities of voice data and video applications and plan for their implementation (10/1/07)

Objective:

3.2. To establish and implement the standards, policies, and specifications of the standards-based shared system

Strategies:

3.2.1. Offer users system access alternatives in multiple frequency bands and technologies to accommodate diverse user needs (7/1/10)
3.2.2. Offer users access in both VHF high band and 700/800 MHz to accommodate diverse user needs (7/1/10)
3.2.3. Provide robust network connectivity with protections for radio traffic (7/1/10)
3.2.4. Accept P25 as the standard for digital system development (4/1/08)
3.2.5. Offer no less than statewide radio system mobile coverage to the users (7/1/10)
    3.2.5.1. Retain the ability to expand up to portable coverage where needed
3.2.6. Adopt an operational system architecture to make the technology as transparent as possible to the end user (7/1/10)
3.2.7. Use available spectrum as effectively and efficiently as possible (7/1/09)
    3.2.7.1.All I/O channels used off-system should be narrowband by 2013
    3.2.7.2.All I/O channels used off-system should be digital by 2013
    3.2.7.3.All I/O channels accessing the system should be narrowband
    3.2.7.4.All I/O channels accessing the system should be digital by 2013
    3.2.7.5.All I/O channels accessing the system should be conventional
    3.2.7.6.All system channels should be narrowband
    3.2.7.7.All system channels should be digital
    3.2.7.8.All system channels should be trunked
3.2.8. Establish and implement the standards, policies, and specifications for the use of intermediate interoperability solutions (4/1/08)
    3.2.8.1.Document channel sharing
    3.2.8.2.Develop SOPs for deployable solutions
    3.2.8.3.Develop SOPs for gateway solutions
3.2.9. Provide sufficient system capacity to maintain functionality under surge conditions (7/1/10)
3.2.10. Keep equipment costs within reach of the smaller agencies (7/1/10)
3.2.11. Maintain consistent hardware and software compatibility throughout the system (7/1/10)
3.2.12. Provide sufficient system security to allow for voice encryption, over-the-air-rekeying, and over-the-air-programming (7/1/10)

Objective:

3.3. To implement a standards-based shared system to meet the interoperable communications needs of the users.

Strategies:

3.3.1. Interconnect existing standards-based shared systems to increase the area of interoperable coverage (7/1/10)

3.3.2. Bring consistency to state agency communications and commit to moving to the interconnected and interoperable radio network (7/1/10)

3.3.3. Identify opportunities to partner with agencies, cooperatives, and private companies to improve communications in Missouri (7/1/08)

3.3.4. Identify and document the permissions and agreements needed for entity sharing and coordination (7/1/08)

3.3.5. Identify and overcome regulatory issues in a multi-agency shared interconnected radio communications system (7/1/08)

3.3.6. Document the policies and procedures necessary to take full advantage of technological capabilities (4/1/08)

3.3.7. Define the role of commercial service in system development, management, and maintenance (4/1/08)

3.3.8. Take a phased building blocks approach, building the system in phases (7/1/07)

3.3.9. Integrate and utilize existing city, county, state, and utility infrastructure assets as much as possible to minimize building costs (7/1/07)

3.3.10. Supplement existing infrastructure with new construction where necessary (7/1/07)

3.3.11. Offer city, county, and utilities access to the network as it is being built in their area (7/1/07)

3.3.12. Offer a building blocks approach, allowing agencies incremented access levels (7/1/07)

3.3.13. Keep the system simple to access and the equipment easy for the user to operate (4/1/08)

Strategic Issue: Training and Exercises

Planning and Coordination

As expressed in previous pages, planning is central to interoperable communications. Too many differences currently exist in responder governance, procedures, and technology to expect communications to "happen" without prior preparation. An ongoing dialogue among agencies, preferably at the regional level, is necessary to prepare for communications on a day-to-day and emergency basis. This dialogue should include both decision makers and communications managers from all disciplines. Several regions now have groups that meet on a regular basis to develop their interoperability plans. This effort is commended and encouraged. Planning at the administrative level and publication of those plans in SOP is essential.

Training

Line function personnel carry out the SOPs. The communicators in the dispatch centers, the technicians in the shops, and the users in the field all must be aware of the SOPs, how it applies to them, and what their roles and responsibilities are. Participants must be educated on the information in the SOPs, familiarized with equipment to be used, and trained in the skills necessary to execute their part if they can be expected to perform well under pressure. Formalized training is fundamental to conveying the necessary information, developing the required skills, and raising the awareness of personnel. Training should not only be upon initial hiring. Regular ongoing, duty-related training as well as disaster training is needed.

Education and training are often overlooked in emergency response and in communications in particular. This trend must be reversed to expect public safety personnel to adequately cope with adverse circumstances. Well-developed curricula and sufficient manpower are necessary to produce well-trained communications users.

Practice

Once information is imparted and skills developed they must be refined and maintained through regular and varied exercises. Such drills keep personnel aware of SOPs, keep skills fresh, and define deficiencies in the procedures. Local and regional exercises, coordinated among multiple agencies, should be sponsored on a regular basis. SEMA has personnel specifically assigned to developing, conducting, monitoring, and evaluating exercises. Participation in the exercises they conduct is very useful in testing capabilities and developing local exercises.

Some of these exercises may be tabletop exercises to simply discuss, plan, coordinate, and document emergency response procedures. Real response exercises should also be held on a frequent basis - especially for communications. Equipment must be inventoried, checked out, deployed, operated, and maintained if needed. Procedures must

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be reviewed, evaluated, followed, and updated. Personnel must be provided refresher training in procedures, equipment setup, and usage procedure. Personnel must be cycled through training and exercises to ensure that all personnel are capable of emergency operation.

4 Goal: Regular Comprehensive Regional Training and Exercises

Objective:

4.1 To see that communications users are adequately trained on communications SOPs and equipment

Strategies:

4.1.1.   Define the standards and policies regarding communications training and exercises (7/1/07)
4.1.2.   Develop a basic required SOP based training template including backup and contingency plans and procedures (7/1/07)
4.1.3.   Use routine, planned usage as an opportunity to practice and review proper procedures and equipment operation (1/1/08)
4.1.4.   Implement training specifically for the use of the designated interoperability channels and NIMS (7/1/07)
4.1.5.   Include training elements in all plans for interoperable communications (1/1/07)
4.1.6.   Include operational training in all communications grant applications (FY07 grant process)

Objective:

4.2. To see that communications SOPs and equipment are kept up to date and in working order

Strategies:

4.2.1.   Advocate functional and realistic live, hands-on, exercises with lessons learned (7/1/07)
4.2.2.   Use routine events as an opportunity to exercise proper procedures and equipment operation (1/1/08)
4.2.3.   Conduct exercises with the intent of validating communications plans and testing procedures rather than predetermining a successful conclusion (7/1/07)
4.2.4.   Use experienced reviewers to validate exercises (7/1/07)
4.2.5.   Include exercises in all plans for interoperable communications (1/1/07)

4.2.6. Include exercises in all interoperable communications grant applications (FY07 grant process)

4.2.7. Require periodic joint exercises involving multiple agencies, regions, states, and disciplines (7/1/07)

Strategic Issue: Usage

Routine, Planned, Urgent, Emergency

There are some solutions that will only be used in actual emergencies and the opportunity to put them into practice may only be in planned events or training exercises. Most solutions, however, can and should be used routinely. The best way to maintain equipment, procedures, and skills is to use them on a daily basis. Day-to-day usage of NIMS integrated SOPs internally is better than only using them for inter-agency emergencies. A robust communications system used everyday is better than deployable equipment that is only powered up once or twice a year. Personnel skills used instinctively over and over daily are better than step-by-step instructions in the SOP manual. By using the same equipment, procedures, and skills everyday, when the routine becomes urgent and the urgent becomes an emergency, focus can be properly placed on the seriousness of the incident rather than the seriousness of the response.

5 Goal: Daily use throughout the State

Objective:

5.1. To define the standards and policies regarding interoperable communications usage

Strategies:

5.1.1. Use interoperability channels and capabilities for day-to-day interoperable communications (1/1/08)
5.1.2. Define tiered categories of interoperable communications capabilities (1/1/08)
5.1.3. Develop a tiered communications response protocol based on incident severity, physical limitations, and time constraints (1/1/08)
5.1.4. Provide that access to interoperable communications capabilities is kept as simple as possible for end users (1/1/08)

Objective:

5.2. To proliferate and implement the standards and policies regarding interoperable communications usage

Strategies:

5.2.1. Require consistent usage of interoperability procedures and equipment among all local, regional, state, and federal agencies (1/1/08)

5.2.2. Require that equipment held in reserve and not in frequent use is regularly inspected, tested, and ready for deployment (1/1/08)

5.2.3. Require that all interoperable communications resources are available for day-to-day usage (1/1/08)

Concluding Summary

Many of the points laid out in this broad-based strategy give independent agencies a wide latitude to set their own priorities with regard to radio communications while still fitting into the overall statewide strategy. The supporting philosophy in Missouri's strategy stands out as:

Missouri supports: regional, collective coordination and cooperation; trained personnel; exercised joint procedures; and shared, capable, compatible assets - everyday.